

C l a i m s

1. A device for a hydraulic cutting tool (30) for cutting at least one pipe (16, 18, 20) beneath a water floor (10), the at least one pipe (16, 18, 20) being disposed in a ground formation (12), wherein hydraulic cutting is carried out from a surface facility (2) equipped with at least the following auxiliary equipment:

5 (a) a hoisting device (36) for hoisting the cutting tool (30) down to or up from a cutting depth (32) in the pipe (16);

10 (b) a high pressure pump (50) for pumping an abrasive fluid (56) from an associated mixing tank (48);

15 (c) a compressor (82) for pumping pressurised gas (86); and

(d) at least one power and control unit (76) for supplying power to and controlling a releasable setting device and a rotating motor in the cutting tool (30);

wherein the cutting tool (30) is made up of:

20 (e) a body (62) fitted with at least the following equipment:

(f) said releasable setting device for pressure tight setting of the cutting tool (30) in the pipe (16),

whereby the pipe (16) is divided into an overlying pipe section (78) and an underlying pipe section (80);

5 (g) a rotatable high pressure pipe (64), the free end of which is connected to a high pressure nozzle (58) from which said abrasive fluid (56) exits in the form of a cutting jet (60) during the cutting, the high pressure pipe (64) projecting down from the body (62) when in the working position;

10 (h) said rotating motor for pipe peripheral rotation of the high pressure pipe (64) and the high pressure nozzle (58) during the cutting; and

15 (i) a short drain line (66) extending axially through the cutting tool (30), the inlet (68) to which, in the working position, is arranged deeper than the high pressure nozzle (58), while its outlet (70) is arranged immediately above the body (62), the short drain line (66) thereby forming the only hydraulic connection between said pipe sections (78, 80) of the pipe (16);

20 wherein said equipment at the cutting tool (30) is connected to said auxiliary equipment on the surface facility (2) via the following connecting lines:

25 (j) a hoisting cable (34) between the cutting tool (30) and the hoisting device (36);

- (k) a high pressure line (38) between the high pressure pipe (64) and the mixing tank (48);
- (l) a pressure line (40) for gas (86) leading from said underlying pipe section (80) axially through the body (62) and up to the compressor (82); and
- (m) at least one auxiliary line (42, 44, 46) for power supply to, control and/or monitoring of equipment in the cutting tool (30);

and where, after the cutting tool (30) has been set but before the cutting is initiated, pressurised gas (86) is pumped continuously through the pressure line (40) and into the underlying pipe section (80), whereby liquid (8) is evacuated through the short drain line (66) and the surface (88) of the liquid (8) is forced down to the inlet (68) to the drain line (66), so as to create a gas filled pipe volume (90) comprising said cutting depth (32) between the body (62) and said inlet (68), whereupon the hydraulic cutting is initiated by continuously pumping abrasive fluid (56) through said high pressure line (38) while rotating the high pressure pipe (64) and the high pressure nozzle (58), characterized in that the outlet (70) of said short drain line (66) is connected to a further drain line (92) extending up to the surface facility (2), the upper end portion of which drain line (92) is connected to at least one adjustable choke device, allowing the gas overpressure in said pipe volume (90) to be controlled during the cutting in order to achieve optimal cutting conditions.

2. A device in accordance with Claim 1,
characterized in that the upper end portion of the drain line (92) is connected to at least one pressure gauge (94).

5 3. A device in accordance with Claim 1 or 2,
characterized in that the cutting tool (30) is associated with at least one pressure gauge (94) measuring the gas pressure in said pipe volume (90).

10 4. A device in accordance with Claim 1, 2 or 3,
characterized in that the cutting tool (30) is associated with a liquid level indicator that measures the level of the liquid surface (88) below the cutting tool (30), whereby the extent of said pipe volume (90) may be determined continuously during the cutting.

15 5. A device in accordance with one of the preceding claims,
characterized in that said at least one adjustable choke device is constituted by a knock-out drum (96) to which the drain line (92) is connected, the knock-out drum (96) being connected at its downstream side to a separate gas outlet pipe (98) with a gas choke valve (102) and a separate liquid outlet pipe (100) with a liquid choke valve (104).

20 6. A device in accordance with Claim 5,
characterized in that the liquid outlet pipe (100) is equipped with at least one liquid flow meter (106).